Dr. Peterson
Lincoln Project Regional Forum
2 p.m. Thursday, April 2, 2015, Emory Conference Center Hotel Boardroom

Student Innovation

Georgia Tech is working to create a climate of innovation across all areas of study. While you would expect a focus on innovation in one of the nation's largest and best engineering programs, innovation is also much a part of programs in computing, architecture, liberal arts, sciences, and business.

Last night we held our 7th annual InVenture Prize competition. InVenture brings together student innovators from all academic backgrounds across campus in an effort to foster creativity, invention, and entrepreneurship. We partner with Georgia Public Broadcasting for the finals, and it was broadcast live. The 2015 InVenture prize had more than 500 students (526) enter the competition. Ultimately 157 students on 55 teams registered and competed in the competition's preliminary round. From there, 29 semifinalist teams were selected, and each competed in a "pitch" format competition, basically "SharkTank" style. Each team came on stage and had 4 minutes to make their pitch before a panel of judges. This resulted in six finalist teams that presented their inventions and business plans live on TV last night.

Winners are automatically accepted into the summer class of Flashpoint, Georgia Tech's startup-accelerator program. Georgia Tech is committed to helping students, faculty and staff, and individuals in the community transform their intellectual property to drive innovation.

We partner with corporate and other sponsors. For example, Intel provides the $20,000 first place award. The Inter-institutional Academic Collaborative of the Atlantic Coast Conference provided the $10,000 second place prize, and we had representatives from 12 ACC institutions at the event last night to see the competition and begin planning for a possible ACC-wide innovation competition. We even run a K-

12 school version of the InVenture Prize, known as the InVenture Challenge @ Georgia High Schools.

Other examples of encouraging student innovation include our enormous Capstone Design Expo and a program called “Ideas to Serve.” It is part of the Institute for Leadership and Entrepreneurship in the Scheller College of Business. It is a competition for current students and recent alumni who have early-stage product ideas or venture concepts geared toward creating a better world.

Invention Studio is a 3,000-square-foot, million-dollar, industry-sponsored, student-run “maker space” that turns Georgia Tech’s creative thinkers into hands-on doers. Dozens of universities have visited to see how they might emulate it.

Innovation Ecosystem at Tech Square – Innovation Centers

The Institute is educating students who will become the intellectual talent that business and industry seek. Research universities play a key role in regional and statewide economic development. Georgia Tech is committed to fostering a climate of innovation, not only for faculty, staff, and students, but also for the state of Georgia and the region.

Georgia Tech is taking a leading role in creating an innovation zone in Midtown Atlanta. Tech is helping people transform their intellectual property to drive innovation, attract and create new business, and transition ideas from the concept stage to the marketplace.

Technology Square is a high-energy hub, creating an exciting environment in which innovation can flourish. What was a blighted location just a little more than ten years ago is now fast becoming the center of the entrepreneurial community in the Southeast. The mixed-use area is a testament to what is possible through a partnership between higher education, the state, business and industry. Tech Square is a unique environment where large companies can establish innovation centers and

outposts, providing opportunities to interact with startup companies as well as the Georgia Tech community, creating synergy and a climate for innovation. Among the corporations with a presence in Tech Square are Home Depot, the AT&T Foundry Innovation Center, the Panasonic Automotive Innovation Center, GM, EY, and ThyssenKrupp.

The Enterprise Innovation Institute, or EI^2, is Georgia Tech's primary business-outreach organization, providing a comprehensive program of assistance to business, industry, entrepreneurs, and economic developers. EI^2 accelerates startup formation through education programs, assists startups through incubators, and amplifies commercialization impact through support programs. In FY2014, EI^2 had an impressive report card. It helped 1,770 Georgia manufacturing companies reduce operating costs by $36 million, increase sales by $191 million, and create or save 950 jobs.

On the importance of University Research:
A story and a graphic on the AAU Website is entitled "How smart would your phone be without university research?"

Try to imagine life without your smartphone. No email, no tweets, no Facebook updates, no alerts from the office. We use smartphones at work, to stay in touch with family and friends, to shop and to explore the world around us. For most of us, life without a smartphone is unimaginable.

Now, picture your smartphone without the pioneering federally funded research done at America's research universities. You can't, because your smartphone would not exist without that research. First, they would likely be far bulkier because they would use bigger batteries. Location-based services? They would not exist without GPS. Your fingers would not work on the touchscreen because multi-touch screens would not exist. And more fundamentally, with no chip or memory they would be empty aluminum shells - if that. All of these components owe a significant debt to federally

funded research at America's research universities.

Here are the components, all from federally-funded research:

- Touchscreen: resistive touch screen developed in 1971 at U of KY
- CPU-3 researchers are credited with inventing the first CPU, at Iowa State University, and 2 at Univ. of Pennsylvania
- Multicore processors: Stanford University, using Dept. of Defense funding.
- Magnetic RAM-MIT with U.S. Navy-supported research
- GPS—satellite navigation invented during the Cold War by a research team at Johns Hopkins University, under a contract with the Dept. of Defense and NASA
- Battery: rechargeable lithium ion batteries made possible by the invention of lithium cobalt oxide cathode materials by physicist John Goodenough during his time at Oxford University. Later at the Univ. of Texas, with funding from NSF and the Dept. of Energy, he made further discoveries on the use of less expensive, alternative materials for the batteries. This work enabled widespread use of the batteries in compact devices -- phones and laptop computers.

Innovation Deficit: the widening gap between the actual level of federal government funding for research and higher education and what the investment needs to be if the U.S. is to remain the world's innovation leader.

I see this as part of my work on the National Science Board. The recently released National Science Board's 2014 Science & Engineering Indicators provides fresh evidence of the innovation deficit. The major Asian economies, taken together, now perform a larger share of global R&D than the U.S. Since 2001, the share of worldwide R&D performed by Asian countries grew from 25 percent to 34 percent. China led this expansion with its global share growing from just 4 percent to 15 percent during this period. Consequently, China alone now performs nearly as

much of the world's high-tech manufacturing as the U.S.

Because the innovation deficit will have serious consequences for our nation’s role as the world’s innovation leader, it will hamper U.S. manufacturing, trade, and economic and national security, jeopardizing our frontrunner status in each of these areas, as well as the best jobs in the world that go with them.

Closing the innovation deficit is essential to sustaining U.S. leadership in biomedical research and innovation. Federally funded research has produced extraordinary health advances and diagnostic innovations, from MRI to anti-cancer and cardiovascular treatments that have added years to Americans’ lifespans. Today’s research is producing discoveries every day that may lead to vaccines, treatments, cures for countless diseases, and diagnostics that make possible early intervention. These innovations benefit not only the health of Americans of people around the world, but also lead to new businesses and industries that provide jobs and strengthen the economy.

Cuts to scientific research, as well as higher education, that have already taken place, combined with the enormous resources that other nations are now pouring into such investments, have created an innovation deficit.

The partnership between our nation’s federal government and research universities is exceptional. Other countries are seeking to emulate that relationship so they too can reap the benefits of a highly-educated citizenry and the discoveries that lead to innovation, new technologies, industries, jobs, and economic growth.

College Affordability/ Return on Investment/ Access

- Georgia Tech is committed to helping students earn a quality, affordable education. Many students take advantage of a combination of co-op, internships, and

scholarships to help with educational expenses, as well as the G. Wayne Clough Georgia Tech Promise for instate students with the greatest needs.

- A Georgia Tech degree is a sound investment. Georgia Tech continually appears on lists of best return on investment for students based on costs and earnings. (CNN Money/ PayScale.com article)
- The median starting salary for Georgia Tech graduates in 2014 was $64,000 for a bachelor's degree and $79,500 for a master's degree.
- While Georgia Tech boasts a top-ranked ROI by almost any measure, the Institute is recruiting students capable of and committed to improving the human condition through science, technology, business, and liberal arts programs.
- An Online Master of Science in Computer Science is offered through a partnership between Georgia Tech, Udacity and AT&T. It is the first accredited Master of Science in Computer Science that students can earn exclusively through the Massive Open Online Course (MOOC) delivery format. The total cost is about $7,000, a fraction of the cost of traditional, on-campus programs. The program has 2,400 students. The program's first graduates will receive their degrees in May.
- Georgia Tech Professional Education teaches over 13,000 learners every year – that's in addition to the more than 21,000 students on campus. GTPE delivers a continuum of learning: an ongoing array of educational courses, professional master's degree programs, and industry partnerships.
- As a public institution, Georgia Tech remains committed to educating the citizens of Georgia and continuing to identify ways to make a Georgia Tech education more affordable, particularly for the in-state students with the highest needs. The G. Wayne Clough Georgia Tech Promise program, unique in the University System of Georgia, offers a debt-free Georgia Tech education to academically qualified Georgia residents from families with annual incomes of less than $33,300 per year. More than 600 students have participated in the program. Almost 350 Georgia Tech Promise students have graduated from Tech.

- In August 2014 Georgia Tech announced a unique scholarship program with the Atlanta Public Schools. All valedictorians and salutatorians in the Atlanta Public School system can become APS Scholars at Tech, including automatic admittance to Georgia Tech and full in-state tuition scholarships for four years. The initiative was designed to increase exposure and access to Georgia Tech for Atlanta Public School's most-prepared students.
- Georgia Tech continues to focus on efforts to improve affordability for students including:
    - Scholarships and fellowships funded by endowed and non-endowed programs managed by the Georgia Tech Foundation
    - Additional funding to supplement scholarships for Pell Grant students
    - One of the nation's top cooperative education programs, providing valuable career experience, improved job prospects after graduation, and a source of funding that can be applied toward expenses. More than 50,000 Georgia Tech graduates have helped pay for their education and earn experience through co-op over the past century.
    - Payment plan for tuition and fees
- Textbook rental program

Georgia Tech's participation in the Complete College Georgia (CCG) initiative has enabled the Institute to put greater emphasis on several aspects of student success. Efforts include:

- Organizational changes for enhanced academic advising and academic support programs
- Allocation of new resources to support positions and programs for military veterans, students with disabilities, and students experiencing academic difficulties

- Continuation of strategic partnerships that seek to improve the readiness of K-12 students throughout Georgia for entry into STEM undergraduate degree programs as well as to support students who seek K-12 teaching opportunities.
- Piloting online undergraduate course offerings in the summer semester through Georgia Tech Professional Education, an effort that may reduce time for degree completion.
- Enhanced programs that target retention of underrepresented students. One example is The Challenge program, a summer bridge program targeting incoming underrepresented minority freshmen to provide them with a five-week, residentially based, immersive experience.